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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

FIVE-YEAR REVIEW (Type Ia)

**ROSE TOWNSHIP DUMP SITE
(ROSE TOWNSHIP-DEMODE ROAD SITE)
Oakland County, Michigan**

I. Introduction

Purpose

The United States Environmental Protection Agency (U.S. EPA) has conducted a Type Ia five-year review for the Rose Township Dump (Rose Township-Demode Road (Rose)) Superfund site pursuant to CERCLA section 121(c), NCP section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991), 9355.7-02A (July 26, 1994), and 9355.7-03A (December 21, 1995). The purpose of a five-year review is to ensure that a site remedy remains protective of human health and the environment and that the remedy is functioning as designed. A Type Ia five-year review is applicable to the Rose site since certain response actions (see below) are ongoing. This document will become part of the Rose site file.

Site Characteristics

The Rose Township-Demode Road site is located in Rose Township, Oakland County, Michigan, approximately 40 miles northwest of Detroit. The site is comprised of approximately 100 acres of undeveloped, rural property. During the mid-1960's, waste solvents and other industrial chemicals were improperly disposed of on portions of the site¹. Following discovery, the State of Michigan removed a large amount of these wastes in 1979-1980 and, under CERCLA authority, U.S. EPA removed more of the contaminants in 1983; however, residual levels of the chemical wastes have adversely impacted the soil and groundwater quality at the site.

Pursuant to CERCLA, U.S. EPA placed the Rose site on the National Priorities List (NPL) in July 1982. U.S. EPA, in consultation with the Michigan Department of Natural Resources (MDNR), now the Michigan Department of Environmental Quality (MDEQ), commenced the conduct of a Remedial Investigation and Feasibility Study (RI/FS) at the site in 1984. The final RI report was released in August 1987. The major findings included:

¹The name "Rose Township Dump" is a misnomer, for the site is not a landfill per se, but is an area of farmland where waste solvents, etc., were dumped.

- Between 1979-1980, the MDNR had removed approximately 5000 55-gallon drums of waste paints and solvents from the site. The solvent wastes were reportedly transported to the landfill in tanker trucks and in 55-gallon drums, which were emptied for reuse, although the drums were also buried, especially if damaged or leaking.
- The upper groundwater aquifer is primarily sand and ranges from 40 to 120 feet thick. Local residences (the closest is 1500 feet downgradient of the northern boundary of the site) use this aquifer as a primary source of drinking water.
- The property has been, and continued to be, a source of groundwater contamination. A groundwater contaminant plume consisting of VOCs has migrated north at least 2000 feet from the primary disposal area along the southwestern edge of the site. The leading edge of the contaminant plume appeared to not have left the site boundaries as yet.
- The predominant organic compounds of concern include vinyl chloride, toluene, xylene, and trichloroethene (TCE), based upon concentrations and potential impacts to human health and the environment.
- Surface soils located adjacent to the southwestern edge of the site were contaminated with PCBs, lead, and VOCs derived from the dumping activities. Sampling indicated that PCB contaminant levels of up to 980 mg/kg (ppm) were present.
- Potential long-term exposure to high levels of VOCs through the use of private wells in contaminated groundwater on-site and plausible long-term exposure to low levels of VOCs in the aquifer downgradient of the site (if left unabated) were identified as the principal threat to human health and the environment. Exposure to high levels of PCBs and lead in surface soils was also identified as a principal threat.

Based on the findings of the RI, U.S. EPA completed an FS that evaluated remedial alternatives to address the principal threats at the site. U.S. EPA released the FS and issued a Proposed Plan for remedial action in August 1987 for public comment. After a 30-day public comment period, U.S. EPA issued a Record of Decision (ROD) on September 29, 1987, that called for the following actions to mitigate the areas of concern:

- Excavation and on-site incineration of PCB-laden and metals-laden surface soils, and VOC-laden subsurface soils, with on-site reburial of the incinerator ash;
- Installation of a groundwater extraction and treatment system to capture and draw back the groundwater contaminant plume; and,

- Implementation of a groundwater monitoring program to ensure the adequacy of the cleanup.

The selected remedy would use permanent treatment systems to eliminate the principal threat posed to human health and the environment by destroying the PCBs in the surface soils and the source of further groundwater contamination in the subsurface soil. The selected remedy would also eliminate a principal threat by extracting and treating the groundwater contaminant plume to identified risk-based cleanup levels.

The selected remedy established cleanup standards for groundwater based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs), risk-based levels, and State of Michigan criteria for protection of groundwater quality.

Shortly before issuing of the ROD, U.S. EPA began to conduct cleanup discussions with numerous potentially responsible parties (PRPs). As U.S. EPA was reaching a cleanup agreement with the PRPs, the Agency issued ROD Amendment #1 in January 1989. ROD Amendment #1 determined that soil flushing³ could be tested as an alternative method to remove VOCs from the subsurface soils. If soil flushing was determined to be a viable cleanup method, it could then be substituted for use as a cleanup remedy, instead of incineration, for the subsurface soils at the Rose site. ROD Amendment #1 did not alter the cleanup methods for either the PCB-contaminated soils or the groundwater contaminant plume(s), nor did it alter the cleanup standards or goals for the PCB-contaminated soils or the groundwater contaminant plume(s).

U.S. EPA reached a settlement with 12 PRPs in late 1988. The settlement is embodied in a Consent Decree (CD) and sets forth the methods that the PRPs must follow to implement the remedial action anticipated by the ROD and ROD Amendment #1. The State highly objected to ROD Amendment #1 and to the terms of the CD, which delayed the lodging of the CD in federal District Court until March 1989. The CD was entered by the court in July 1989. Therefore, initial pre-design and design work did not begin until July 1989. State objections filed in federal Appellate Court further delayed the commencement of design work until late 1990.

³Soil flushing is essentially a soil washing process that is performed in the ground instead of in a process tank. The ground surface is flooded with clean water which percolates into the contaminated soil zones. The water dissolves or flushes the chemical contaminants down into the groundwater contaminant plume. Once in the groundwater, the flushed chemicals are removed through conventional groundwater pump and treat methods. Soil flushing mirrors natural rain and snowmelt infiltration processes, although on a larger scale, to help speed up the cleanup of the soils.

II. Discussion of Remedial Objectives

The Remedial Design and subsequent construction of an on-site incinerator for the PCB-incineration phase was completed in September 1992. During this time U.S. EPA had reviewed the soil flushing laboratory results submitted by the PRPs in 1992. U.S. EPA determined that soil flushing was not a viable method for cleanup of VOCs in soils and, in accordance with the CD, directed the PRPs to perform a focused feasibility study to determine a viable cleanup method for the VOCs in the soils. The PRPs, in the focused FS, examined the presumptive remedies for VOCs in soils (soil vapor extraction (SVE), low-temperature thermal desorption, and on-site incineration) and recommended that SVE be pilot tested to determine if it was a viable cleanup technology for use at the Rose site.

The PRPs, under U.S. EPA oversight, performed two separate SVE pilot tests in January 1994 and January 1995. The results indicated that SVE was a viable technology for most of the impacted soils and that supplemental technologies may have to be implemented to complete a soils cleanup in certain areas of the site. U.S. EPA released for public comment the focused FS and a Proposed Plan for ROD Amendment #2 in Summer 1995 and then signed ROD Amendment #2 in August 1995. ROD Amendment #2 called for substitution of SVE cleanup technology for on-site incineration of the VOC-laden soils.

Upon completion of incineration (see below), the PRPs began design work for the SVE and groundwater remedial actions in early 1994. The designs for the groundwater extraction and treatment and SVE systems were approved by U.S. EPA in October 1995.

The PRPs, under U.S. EPA oversight, began on-site incineration of soil containing (10 mg/kg or more) PCBs in September 1992. Approximately 34,000 dry tons of soil had been treated (to less than 2 mg/kg PCBs) when the incineration cleanup phase was completed on October 13, 1993. In addition, nearly 5,000 cubic yards of lead-contaminated soils were excavated, tested for leachability of lead (EP Toxicity), and then buried on-site with the incinerator ash beneath a minimum of 5 feet of clean cover soil. U.S. EPA took many soil and ash samples at the site as the cleanup progressed to ensure that cleanup objectives were being met. U.S. EPA held a final inspection at the site on August 17, 1994, to verify that the on-site incinerator had been removed from the site and that all treatment residuals had been properly taken care of by the PRPs.

In Winter 1992, as an interim measure, the PRPs installed a small capacity air stripper on site to begin pumping and treating contaminated groundwater. The interim groundwater cleanup measure began operating in March 1992, treating groundwater at a rate of 40 gallons per minute. The interim measure was designed

to delay the advance of the groundwater contaminant plume until the final groundwater extraction and treatment system was operational, for the final treatment system could not be completely designed and constructed until the incinerator had been dismantled and removed from the site (the incinerator was constructed above an area of groundwater contamination).

Upon completion of the incineration phase of the cleanup, the PRPs began design and installation of the SVE and the final groundwater extraction and treatment systems. Certain portions of the remedies were constructed as the design review progressed, helping to speed up the construction completion schedule. For the SVE system, approximately 57 shallow vacuum/air-injection wells were installed in the subsurface soils to remove VOCs from the contaminated soils above the groundwater aquifer. Air withdrawn from the soils is treated by vapor phase activated carbon units to remove VOCs prior to discharge to the atmosphere.

A final inspection of the SVE system was conducted by the remedial project manager for U.S. EPA on November 30, 1995. The PRP contractor started operation of the SVE system during the final inspection and, at that time, it was determined that the SVE system was constructed and was operating as designed. By December 4, 1995, the initial carbon adsorption units had been saturated with VOCs and had to be changed out. Soil cleanup levels are expected to be achieved in 12 to 24 months.

For the groundwater extraction and treatment system, the PRPs installed a total of six extraction wells within the groundwater contaminant plume. The system as a whole is designed to pump between 250 and 300 gallons per minute. A treatment plant was constructed nearby, where the extracted groundwater will be subjected to air stripping for VOC removal prior to discharge to the adjacent wetlands in accordance with the substantive requirements of a NPDES discharge permit. The air stripper will discharge vapor directly to the atmosphere, untreated, in accordance with the substantive requirements of a state air use permit. The ROD estimated that the groundwater extraction and treatment system would need to operate for between 10 and 30 years to achieve required cleanup levels.

A final inspection of the groundwater extraction and treatment system was conducted by the U.S. EPA remedial project manager on February 3, 1996. At that time, it was determined that the groundwater extraction and treatment system was constructed as designed. The system began operating on February 5, 1996.

U.S. EPA conducted oversight of PRP remedial design and remedial action construction management activities at the site through the ARCS contracting program. All design plans and field activities were reviewed and approved by U.S. EPA to ensure consistency with the ROD, the RD/RA work plan, and federal and State requirements.

The design and construction QA/QC program utilized throughout the RD/RA by the PRPs was in accordance with U.S. EPA protocols. Details of the analytical procedures used to ensure the quality of the work are contained in the approved Quality Assurance Project Plan (QAPP) for the pre-design studies and for construction of the on-site incinerator, of the SVE system, and of the groundwater extraction and treatment system (Construction Quality Assurance Plan (CQAP)). The construction QA/QC program utilized has been sufficient to allow U.S. EPA to make the determination that all reported materials specifications are adequate and construction methods used allowed remedy construction to be satisfactorily performed in accordance with the ROD and the two ROD Amendments.

Monitoring Program

A monitoring program has been established for the O&M phase of the cleanup. Quarterly groundwater monitoring is being performed to ensure that hydraulic capture of the plume is occurring and that chemical levels in the groundwater are decreasing. Analyses to be performed will include the chemicals of concern listed in the ROD and CD and those parameters required under the NPDES discharge permit issued by MDEQ. At a later date the monitoring will be performed semi-annually and then annually (as necessary). U.S. EPA, in consultation with MDEQ, will certify completion of groundwater remediation activities once it has been determined that cleanup levels have been attained and maintained for all chemicals of concern listed in the ROD and CD.

Subsurface soils will be sampled by the PRPs to verify that the SVE system has completed the soils cleanup. Initially, soil gas will be sampled on a periodic basis to determine whether the soils cleanup is occurring as designed or if it is completed. U.S. EPA, in consultation with MDEQ, will certify completion of soil remediation activity once it is demonstrated that the SVE system no longer contributes to the cleanup of the contaminated soils and follow-up soil samples show that soil cleanup levels have been achieved.

III. Recommendations

The construction of the SVE and groundwater extraction and treatment systems has been completed and operations are ongoing. U.S. EPA recommends that the PRP group continue operations as designed until final soil and groundwater cleanup levels, as set forth in the ROD and CD, are achieved.

IV. Statement on Protectiveness

With the continued implementation of the remedial action (SVE) pursuant to the ROD, as amended, and the Consent Decree, and if the groundwater extraction and treatment system continues to be

implemented as designed, the remedy selected for the Rose site remains protective of human health and the environment.

V. Next Five-year Review

The next five-year review at the Rose site is scheduled to be conducted prior to September 30, 2002.

William E. Muno
for William E. Muno, Director
Superfund Division

18 July 97
Date